

IN THE CLAIMS

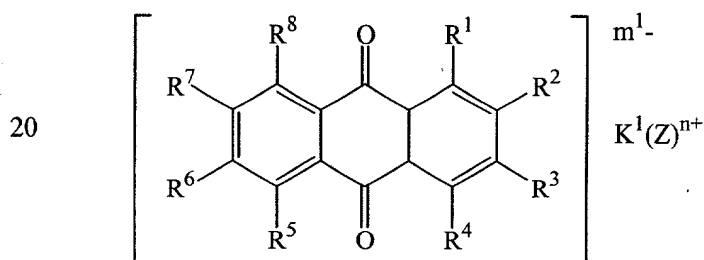
1. A thermoplastic resin composition for laser welding comprising:

- 5           1) thermoplastic resin; and  
               2) laser-transmitting black colorant comprising amine salt of anthraquinone dye.

2. A thermoplastic resin composition for laser welding comprising:

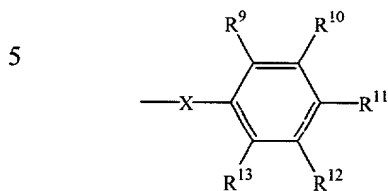
- 1) thermoplastic resin; and,  
 10           2) laser-transmitting black colorant comprising amine salt of anthraquinone dyes of formula [I] or formula [II],

wherein Formula [I] is:

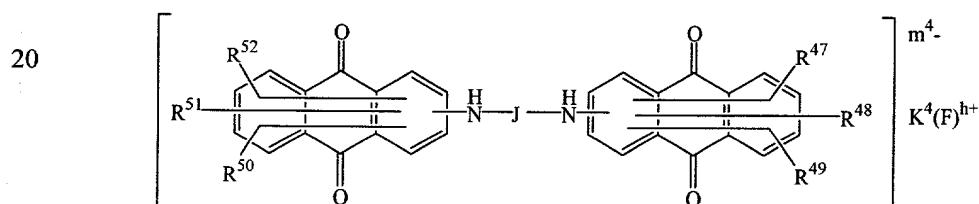


25           wherein  $\text{R}^1$  to  $\text{R}^8$ , which may be the same or different, are independently selected from the group consisting of H, alkyl, aryl, alkenyl, alkoxy, amino, hydroxy, halogen atom, acyl, acyloxy, acylamide, acyl-N-alkylamide, carboxyl, alkoxy carbonyl, cyclohexylamide, sulfonyl, formula [I-a], or -Y-W, and at least  
 30           one of  $\text{R}^1$  to  $\text{R}^8$  is of formula [I-a]; wherein Y is S, O, or NH; wherein W is selected from unsubstituted or substituted alkyl group, alkenyl group, and unsubstituted or substituted aryl group; wherein  $(\text{Z})^{n+}$  represents ammonium ion or a cation derived from an organic amine compounds or a basic dye; wherein n is 1 or 2,  $m^1$  is an integer from 1 to 4 and  $\text{K}^1$  is the ratio of  $m^1 / n$ ;

and wherein formula [I-a] is:



- 10 wherein X is O or NH, and R<sup>9</sup> to R<sup>13</sup>, which may be the same or different, are independently selected from the group consisting of H, alkyl, aryl, alkenyl, alkoxy, amino, N-alkylamide, N-arylamide, hydroxy, halogen atom, acyl, acyloxy, acylamide, acyl-N-alkylamide, carboxyl, alkoxycarbonyl, or sulfonyl; wherein at least one of R<sup>1</sup> to R<sup>8</sup> and R<sup>9</sup> to R<sup>13</sup> is sulfonyl group; and wherein
- 15 formula [II] is:

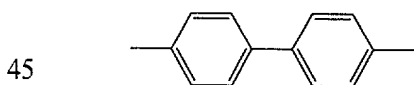


- wherein R<sup>47</sup> to R<sup>52</sup>, which may be the same or different, are independently selected from the group consisting of H, alkyl, aryl, alkenyl, alkoxy, amino, N-alkylamide, N-arylamide, hydroxy, halogen atom, acyl, acyloxy, acylamide, acyl-N-alkylamide, carboxyl, alkoxycarbonyl, or sulfonyl; and at least one of R<sup>47</sup> to R<sup>52</sup> is of sulfonyl; and
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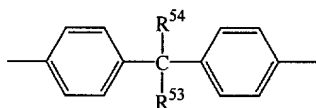
Formula J in formula [II] is selected from formula [II-a] or formula [II-b] and

- 35 binds two anthraquinone,

Wherein formula [II-a] is:



- 50 and formula [II-b] is:



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wherein  $R^{53}$  to  $R^{54}$ , which may be the same or different, are independently selected from the group consisting of alkyl(having 1 to 8 carbon atoms) or hydrogen ;

and wherein  $(F)^{h+}$  represents ammonium ion or a cation derived from an organic amino compounds or a basic dye wherein  $h$  is 1 or 2,  $m^4$  is an integer from 1 to 4 and  $K^4$  is the ratio of  $m^4/h$ .

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3. The composition of claim 1 further comprising a second dye mixed with said amine salt of said anthraquinone dye to produce a laser-transmitting black dye.

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4. The composition of claim 2 further comprising a second dye mixed with said amine salt of a said anthraquinone dye to produce a laser-transmitting black dye.

5. The composition of Claim 4, wherein said second dye is selected from the group consisting of perinone dyes, monoazo complex dyes, anthrapyridone dyes and anthraquinone dyes.

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6. The composition of Claim 2 further comprising (i) a red dye to be mixed with said amine salt of said anthraquinone dye to produce a laser-transmitting black dye, said red dye selected from the group consisting of perinone dyes, monoazo complex dyes, and anthrapyridone dyes; and (ii) an additional yellow dye to be added to said mixture selected from the group consisting of monoazo complex dyes and anthraquinone dyes.

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7. The composition of any one of claims 1-6 in which said thermoplastic resin is polyamide or polyester.

8. The composition of Claim 7, further comprising reinforcing agent.

9. A laser-transparent article formed from the composition of any one of Claims 1-6.

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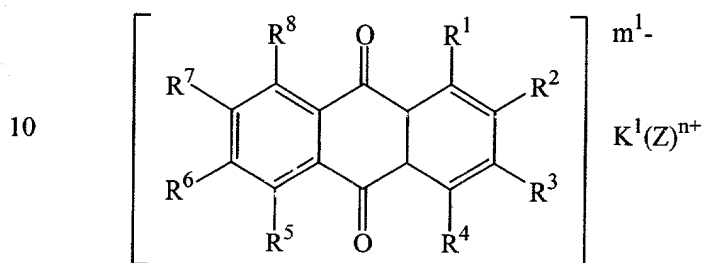
10. An article formed by laser welding an opaque article with the laser-transparent article of Claim 9.

11. A laser-transmitting black colorant suitable for being mixed with a thermoplastic resin comprising at least amine salt of anthraquinone dyes.

12. A laser-transmitting black colorant suitable for being mixed with a thermoplastic resin comprising amine salt of anthraquinone dyes of formula [I] or formula [II],

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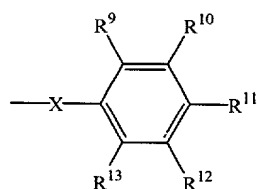
wherein Formula [I] is:



wherein  $\text{R}^1$  to  $\text{R}^8$ , which may be the same or different, are independently selected from the group consisting of H, alkyl, aryl, alkenyl, alkoxy, amino, hydroxy, halogen atom, acyl, acyloxy, acylamide, acyl-N-alkylamide, carboxyl, alkoxycarbonyl, cyclohexylamide, sulfonyl, formula [I-a], or -Y-W, and at least one of  $\text{R}^1$  to  $\text{R}^8$  is of formula [I-a]; wherein Y is S, O, or NH; wherein W is selected from unsubstituted or substituted alkyl group, alkenyl group, and unsubstituted or substituted aryl group; wherein  $(\text{Z})^{n+}$  represents ammonium ion or a cation derived from an organic amine compounds or a basic dye; wherein n is 1 or 2,  $m^1$  is an integer from 1 to 4 and  $\text{K}^1$  is the ratio of  $m^1 / n$ ; and wherein formula [I-a] is:

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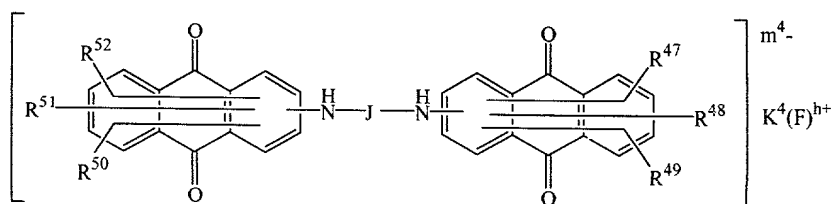
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wherein X is O or NH, and  $\text{R}^9$  to  $\text{R}^{13}$ , which may be the same or different, are independently selected from the group consisting of H, alkyl, aryl, alkenyl, alkoxy, amino, N-alkylamide, N-arylamide, hydroxy, halogen atom, acyl, acyloxy, acylamide, acyl-N-alkylamide, carboxyl, alkoxycarbonyl, or sulfonyl; wherein at least one of  $\text{R}^1$  to  $\text{R}^8$  and  $\text{R}^9$  to  $\text{R}^{13}$  is sulfonyl group; and wherein formula is [II]:

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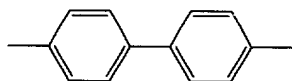


5 wherein  $R^{47}$  to  $R^{52}$ , which may be the same or different, are independently selected from the group consisting of H, alkyl, aryl, alkenyl, alkoxy, amino, N-alkylamide, N-arylamide, hydroxy, halogen atom, acyl, acyloxy, acylamide, acyl-N-alkylamide, carboxyl, alkoxycarbonyl, or sulfonyl; and at least one of  $R^{47}$  to  $R^{52}$  is of sulfonyl; and

10 Formula J in formula [II] is selected from formula [II-a] or formula [II-b] and binds two anthraquinone,

Wherein the formula [II-a] is:

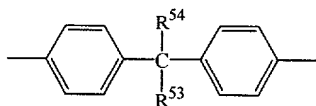
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and wherein the formula [II-b] is:

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wherein  $R^{53}$  to  $R^{54}$ , which may be the same or different, are independently selected from the group consisting of alkyl(having 1 to 8 carbon atoms) or hydrogen ;

and wherein  $(F)^{h+}$  represents ammonium ion or a cation derived from an organic amino compounds or a basic dye wherein h is 1 or 2,  $m^4$  is an integer from 1 to 4

45 and  $K^4$  is the ratio of  $m^4/h$ .

- 13 .The composition of Claim 12, where in the laser-transmitting black colorant  
suitable for being mixed with a thermoplastic resin comprising at least amine salt  
of anthraquinone dyes of formula [I] where as at least one of  $R^9$ ,  $R^{10}$ ,  $R^{11}$ ,  $R^{12}$  and  
5  $R^{13}$  of formula [I-a] is sulfonyl group.

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